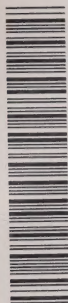
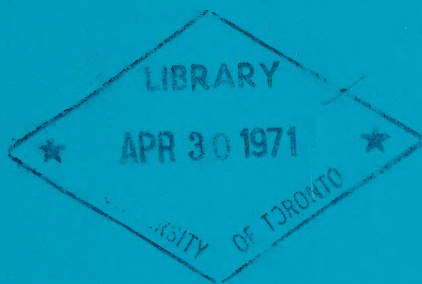


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THE CANADIAN AERADIO STATION

MINISTRY OF TRANSPORT



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THE AERADIO STATION

The Telecommunications and Electronics Branch of the Ministry of Transport operates more than one hundred Aeradio Stations in Canada. Most are located along established airways or air routes and are associated with both large and small airports. These aeronautical communications stations are staffed by fully trained and qualified personnel, whose primary responsibility is the provision of an efficient safety service for the benefit of all pilots.

The varied Aeradio services are described briefly in this booklet. Included also are the basic communications procedures used throughout the system, and some of the more important Regulations governing radio-telephone stations in the aeronautical service.

Aeradio station communications with aircraft are conducted on a standard set of frequencies. This includes the emergency channel 121.5 MHz, the itinerant or general purpose channel 126.7 MHz and the advisory channel 122.2 MHz. Most stations have 122.1 MHz (receive only), some have 3023.5 kHz (receive only), and a number of the more northerly stations are equipped with 5680 kHz for the reasonably long-range requirements of non-scheduled operations outside designated airways.

Because of the limited number of Aeradio stations in some northern areas, total VHF coverage is not possible, especially for aircraft at lower altitudes. The 5680 kHz channel extends the communications range of our northern stations to a degree that provides an extra margin of safety in difficult flying areas. The frequency is intended for use in any emergency situation and when contact cannot be made on other Aeradio facilities. Proper use of this channel permits pilots to follow more easily the recommended practice of frequent position reporting, in the interests of prompt Search and Rescue assistance during emergency situations.

Where difficult communication conditions prevail, e.g. in mountainous terrain, or where an extended communications capability is necessary in the interests of flight safety, remote transmitting and receiving facilities are employed. These "satellite" units are operated from the nearest Aeradio station. Remoted services can range from a single VHF channel to the full standard Aeradio complement, depending on the operational need. All routine air-ground services are available through remoted facilities.

"Air Navigation Radio Aids", a Telecommunications and Electronics Branch publication available by subscription from the Queen's Printer, provides up-to-date information on all Ministry of Transport Aeradio facilities, along with other pertinent aeronautical information.

SERVICES

Airport Advisory – All Aeradio stations located at airports without control tower facilities provide an Airport Advisory service to arriving and departing aircraft. The service is available also from Aeradio stations at controlled airports when the control tower is not in operation. Actual traffic control is not exercised by Aeradio personnel; however, the “advisory” method of operation permits safe and efficient use of airports having reasonably low traffic volume. A landing or takeoff advisory may include – wind direction and velocity, the favoured runway, ceiling and visibility (when conditions are marginal), altimeter setting, pertinent Notices to Airmen (NOTAM), airport conditions (snow cover, braking action, construction work, obstructions, bird activity, etc.), and observed or reported local airport traffic. To ensure that the local traffic portion of the advisory is as accurate and complete as possible, all arriving and departing aircraft are encouraged to guard an Aeradio station frequency while within an approximate ten mile radius of the airport. In addition to the standard advisory data, stations, when requested, will pass information on airport taxi routes and patterns, authorized instrument approach procedures and specific weather reports.

Flight Advisory – Includes the relay of Air Traffic Control clearances and other instructions, acceptance of Flight Plans and Flight Notifications for relay to ATC, provisions of pertinent weather reports and forecasts, information on the status of navigation aids, communications facilities and airports, handling of aircraft position reports, relay of Pilot Weather Reports (PIREPS).

The pilot is of course a major contributor to the valuable PIREPS program, since without his support in providing the Aeradio station with accurate in-flight summaries of current conditions, both voluntarily and on request, there could be no such service. All reports receive careful attention from station personnel. They are routed immediately to meteorological office and, while valid, are relayed to specific aircraft and included in regular broadcasts.

Although aircraft flying in accordance with Visual Flight Rules (VFR) are not normally required to observe position reporting procedures, all VFR flights are urged to report to Aeradio stations at regular intervals. These reports are not passed to ATC but are recorded carefully and are made available to ATC and Search and Rescue units in the event of an emergency.

In the interests of flight safety in uncontrolled airspace, Aeradio stations located outside of controlled areas perform an important additional "advisory" function. It is an established practice for IFR flights to contact the associated Aeradio station when making a descent to or departure from airports in uncontrolled areas. (The 122.2 MHz channel is used for this purpose). The pilot is given all available traffic information, thus reducing the potential hazard of aircraft operating in close proximity. Also, in these northern areas, all aircraft flying within fifty miles of aerodromes where there is an Aeradio station but no Control Tower, are advised to establish contact (preferably on 122.2 MHz), giving flight plan details, last known position, track and altitude.

By virtue of their connection to meteorological communications networks, Aeradio stations are capable of providing comprehensive weather information to aircraft in flight. Latest current weather reports, terminal forecasts and forecasted upper winds are readily available for relay to pilots on request. Special weather data requirements, e.g. route forecasts, are obtained by the Aeradio operator when specific requests are made by pilots. This service is of course not immediate, since the non-routine data must be requested and obtained from a Meteorological Forecast Office. Adequate advance notice from pilots for such requirements is necessary to ensure receipt of data in good time for effective use.

Broadcasts – Using the navigation aid frequency/ies, Aeradio stations make regular broadcasts of the latest aviation weather reports for all key locations in the general station area. Pertinent changes in weather conditions are broadcast as soon as they are issued. Regular broadcasts contain, in addition to ground observed weather data, any valid PIREP's that are available. Another form of special weather data – SIGMET (Significant Meteorological Message), is broadcast also. These messages provide short term notice of weather phenomena important to aircraft in flight, e.g. thunderstorm, hail, icing, etc. They are issued by a number of meteorological forecast offices. Current NOTAMS are included in all broadcasts. Complete weather broadcast schedules and content may be found in ANRA (Air Navigation Radio Aids).

Pre-Flight Assistance – Given to pilots by those Aeradio stations performing this function covers two basic areas – weather information and other (non-weather) aeronautical information. With ready access to forecasts and factual weather data, the pilot can obtain an accurate picture of current and expected conditions along the planned route of flight. The operator maintains an effective program by displaying complete and up-to-date briefing material, by having a good knowledge of the format and content

of pertinent forecasts and other printed weather data, by being familiar with weather teletype schedules, station designators, and valid periods of all data. The Aeradio station also endeavours to promote the best possible pilot participation in the PIREPS program. (It is well recognized that a Pilot Weather Report from a recently completed or continuing flight can be extremely valuable to a pilot at the pre-flight stage preparing for a flight along the same route.)

Assistance with non-weather aspects of planned flights may include information on the status of enroute and terminal air navigation aids and facilities at departure, destination and alternate airports, as determined from Notices to Airmen on display at most stations. The operator provides liaison with ATC for flight planning purposes. A good library of reference material including charts, circulars, and information publications is maintained at all stations to enable the operator to assist pilots with frequencies, air route information, distances, etc.

ATC Liaison – Aeradio stations are connected to Area Control Centres by direct interphone in most cases, permitting quick access to centre facilities for those aircraft requiring in-flight instructions when flight paths do not permit direct radio contact with ATC units.

Teletype – While a relatively small number of stations (in Canada's north) must rely on radiotelephone communications for relay of aircraft movements and other aeronautical information, the great majority are part of a large computer-based teletype network which effectively links all stations through major automatic relay centres. This system permits fast and thorough distribution of Notices to Airmen, supports ATC communications as necessary, and accommodates various types of aeronautical traffic on a priority basis.

Monitoring – Aeradio stations are charged with the responsibility of monitoring associated radio navigation systems on a full time basis. This includes low-frequency radio ranges, non-directional radiobeacons, instrument landing systems, VHF omni-range, TACAN. Technician dispatch and the issue of Notices to Airmen are important associated functions that help to provide efficient maintenance support and advertisement of malfunctions.

Weather Observing – About eighty Aeradio stations take part in full or part-time meteorological programs of varied scope, including the observing, recording and dissemination of weather data for aviation purposes on a continuous hourly basis, or, at remote locations, taking periodic "synoptic" observations which are used primarily by forecast offices.

Emergencies — Operating personnel at Aeradio stations by maintaining extremely careful guard on assigned radio channels, can be alerted quickly to in-flight “distress” or “urgency” conditions in their operational area, either by direct contact or by interception of signals. All are trained in efficient emergency communications and follow internationally accepted procedures that are designed to give all possible assistance to aircraft in trouble. Our stations, particularly those in the north, contribute also to Search and Rescue operations by close coordination with other involved units on communications requirements.

Domestic Paid Air-Ground — For the benefit of airlines in general and especially for those not having extensive private communications facilities, all Aeradio stations provide additional services on a paid subscriber basis. The monthly charge to a subscribing airline depends on the amount of flying and the number of stations involved. There is a minimum charge per month for each station whose services are contracted for. The main features of “DPAG” are — 1) the acceptability of air-to-ground Company message traffic in categories not handled in a routine Aeradio operation, 2) the relay of this traffic to local and distant company offices at locations where DPAG is subscribed to. Some types of messages bear an additional flat rate charge; most are included in the general fee for the basic air-ground service.

Provision of excellent **Flight Assistance** services is the common aim of our aeronautical stations and they are well able, with modern electronic equipment and highly qualified personnel, to shoulder the attendant duties and responsibilities. It may be well to emphasize that all of the Aeradio services outlined here (except DPAG) are offered free of charge to the flying public.

REGULATIONS

General – The statutory controls exercised by the Government of Canada through the Department of Communications over the use of radio are contained in the Radio Act. Among other things, this act provides for –

1. The licensing of radio stations on board civil aircraft registered in Canada
2. Examinations for certificates of proficiency in radio operation
3. The requirement that radiotelephone equipment installed in any civil aircraft registered in Canada or at any Canadian aeronautical ground station be operated by persons holding an appropriate Certificate of Proficiency in Radio (in most cases a Restricted Radiotelephone Operator's Certificate will suffice)
4. Penalties to a maximum of \$2,500. and imprisonment for a term not exceeding twelve months, or both fine and imprisonment and possible forfeiture of the radio equipment involved, for violations of the Radio Regulations.

Unauthorized Communications – Unnecessary transmissions of any kind are not permitted. Communications must be restricted to those necessary for the transmission of authorized messages. Profane and offensive language is strictly prohibited.

False Distress Signals – Any person who knowingly transmits or causes to be transmitted any false or fraudulent distress signal, call or message, or who without lawful excuse interferes with or obstructs any radio communication, is guilty of an offence.

Secrecy of Communication – All persons who become acquainted with radiocommunications are bound to preserve the secrecy of correspondence. No person shall divulge the contents of, or even the existence of correspondence transmitted, received or intercepted by a radio station, except to the addressee of the message or his accredited agent, or to properly authorized officials of the Government of Canada, or a competent legal tribunal, or an operator of a telecommunications system as is necessary for the furtherance or delivery of the communications. The foregoing restrictions do not apply to messages of distress or urgency, or to messages

addressed to "all stations", i.e., weather reports, storm warnings, notices to airmen, etc.

The Reciprocal Agreement — A convention between Canada and the United States of America relating to the operation by citizens of either country of certain radio equipment or stations in the other country, provides that an American citizen may operate the radio equipment installed in a Canadian aircraft if:

1. he holds a Canadian or U.S.A. pilot's licence,
2. he holds a U.S.A. radio operator's licence or permit,
3. the operation of the radio equipment is complimentary to his functions and duties as a pilot, and
4. the radio is operated in accordance with Canadian laws and regulations.

PROCEDURES

These are the basic communications procedures used in the Aeradio environment. The standards are adapted from those formulated by the International Civil Aviation Organization (ICAO).

Procedure Words and Phrases – While it is not practical to lay down a precise phraseology for all radiotelephone procedures, the following words and phrases should be used where applicable. Words and phrases such as “OK”, “REPEAT”, “HOW IS THAT”, etc., or slang expressions should not be used.

Word or Phrase	Meaning
ACKNOWLEDGE	Let me know that you have received and understood this message.
AFFIRMATIVE	Yes, or Permission granted.
BREAK	I hereby indicate the separation between portions of the message. (To be used where there is no clear distinction between the text and other portions of the message).
CONFIRM	My version is . . . is that correct?
CORRECTION	An error has been made in this transmission. (or message indicated). The correct version is . . .
GO AHEAD	Proceed with your message
HOW DO YOU READ	Self-explanatory.
I SAY AGAIN	Self-explanatory.
NEGATIVE	No, or Permission not granted, or That is not correct, or I do not agree.
OVER	My transmission is ended and I expect a response from you.

Word or Phrase	Meaning
OUT	This conversation is ended and no response is expected.
READ BACK	Repeat all of this message back to me exactly as received, after I have given OVER. (Do not use the word "repeat").
ROGER	I have received all of your last transmission.
ROGER NUMBER	I have received your message number . . .
SAY AGAIN	Repeat all, or the following part, of your last transmission. (Do not use the word "repeat").
SPEAK SLOWER	Self-explanatory.
STANDBY	Self-explanatory.
THAT IS CORRECT	Self-explanatory.
VERIFY	Check coding, check text with originator and send correct version.
WILCO	Your instructions received, understood, and will be complied with.
WORDS TWICE	<p>(a) As a request: Communication is difficult, please send each word twice.</p> <p>(b) As information: Since communication is difficult, I will send each word twice.</p>

Word Spelling – The words of the ICAO spelling alphabet which follow should be learned thoroughly so that, whenever isolated letters or groups of letters are pronounced separately or when communication is difficult, the alphabet can be easily and fluently used.

A – ALFA	J – JULIETT	S – SIERRA
B – BRAVO	K – KILO	T – TANGO
C – CHARLIE	L – LIMA	U – UNIFORM
D – DELTA	M – MIKE	V – VICTOR
E – ECHO	N – NOVEMBER	W – WHISKEY
F – FOXTROT	O – OSCAR	X – X-RAY
G – GOLF	P – PAPA	Y – YANKEE
H – HOTEL	Q – QUEBEC	Z – ZULU
I – INDIA	R – ROMEO	

Transmitting Techniques – The efficient use of radiotelephone depends very greatly on the method of speaking and articulation of the operator. As the distinctive sounds of consonants are liable to become blurred in the transmission of speech and as words of similar length containing the same vowel sounds are apt therefore to sound alike, special care is necessary in their pronunciation.

Speak all words plainly and end each word clearly so as to prevent the running together of consecutive words. Avoid any tendency to shout, to accent syllables artificially, or to talk too rapidly. The following points should be kept in mind when using radiotelephony:

SPEED

Keep the rate of utterance constant, neither too fast nor too slow. Remember that the operator receiving your message has to write it down.

PITCH

Remember that high pitched voices transmit better than low pitched ones.

RHYTHM

Preserve the rhythm of ordinary conversation. In separating words so that they are not run together, avoid the introduction of sounds that do not belong, such as “er” and “um”.

MICROPHONE POSITION

Maintain at all times the correct position between mouth and microphone for the microphone in use. Usually the lips of the operator should not be more than one inch from the microphone.

Priority of Communications – In general the following priorities are applied to radiocommunications by Aeradio stations in the aeronautical mobile service:

1. Emergency communications (Distress and Urgency)
2. Flight Safety communications
(ATC clearances, airport advisories, position reports, airfile flight plans, etc.)
3. Scheduled broadcasts
4. Unscheduled broadcasts
5. Other air-ground communications
(Meteorological messages, flight regularity messages).

Note – NOTAM, SIGMET or PIREP messages are generally handled as priority item (4); however, the immediate importance of some of these messages may justify a much higher priority.

Emergency Communications – Emergency traffic includes all radio-telephony messages relative to distress and urgency conditions. These conditions may be defined as:

Distress	A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.
Urgency	A condition concerning the safety of an aircraft or other vehicle, or of some person on board or within sight, but which does not require immediate assistance.

Recommended aircraft action with respect to air-ground communications during emergency conditions will be found in Air Navigation Radio Aids (ANRA).

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